



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,230	11/14/2001	James R. Priest	25135A	3945

22889 7590 02/28/2003

OWENS CORNING  
2790 COLUMBUS ROAD  
GRANVILLE, OH 43023

EXAMINER

ARTMAN, THOMAS R

ART UNIT PAPER NUMBER

2882

DATE MAILED: 02/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.	Applicant(s)
		09/581,250	PRIEST ET AL.
Office Action Summary		Examiner	Art Unit
		Thomas R Artman	2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) 1 and 8-9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

### Attachments:

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No. _____     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Sheet on Status of PTO-1449 Paper No. _____  | 6) <input type="checkbox"/> Other _____                                     |

**DETAILED ACTION*****Claim Objections***

Claims 1 and 8-9 are objected to because of the following informalities: the statement where "the radius of curvature of the ... reinforcement fiber is less than or equal to a critical bending point radius of the ... fiber," is incorrect in light of the specification. It should read, "...the radius of curvature of the...reinforcement fiber is greater than or equal to" the critical bending point radius of the fiber. The claims shall be examined upon these merits. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Wright (US 5,212,750).

Regarding both claims, wright discloses the structure as follows in his fiber optic connector (Fig.3):

1) a crimp ring (item 73).

Art Unit: 2882

3) a reinforcement fiber (item 35) secured over the leading edge and under the crimp ring such that the radii of curvature of the reinforcement fiber and the leading edge are greater than or equal to the critical bending radius of the reinforcement fiber (col.7, line 62, to col.8, line 7).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3, 5 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright and in view of Higdon et al. (Mechanics of Materials).

With respect to claim 2, though Wright does not disclose the derivation of the critical bending radius, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the critical bending radius is a function of the diameter, elastic modulus, and tensile strength of the reinforcement fiber. The criticality lies in the tensile stress on the radially outermost portion of the fiber caused by its bent state. Higdon provides not only this general information, but also provides a detailed derivation that directly relates the radius of curvature to the bending stresses (p.356), and hence, the tensile stress anywhere on the cross-section of a bent rod. By substituting the tensile strength of the material for the tensile stress in the equation, one can easily compute the critical bending radius of curvature for a rod-like

p.357, #7.5.

In regards to claim 3, Wright does not specifically disclose calculations. However, one with ordinary skill in the art can easily use equations 7-1 and 7-2 on p.356 of Higdon to arrive at the claimed calculation. From eq.7-1, solve for  $M$  in terms of the tensile stress ( $\sigma$ ), and then substitute that expression for  $M$  in eq.7-2 in order to express the radius of curvature as a function of the tensile stress. Again, this general process is required for solving the homework problem 7.5 on p.357. It would have been obvious to one of ordinary skill in the art at the time the invention was made to calculate the critical bending radius of the reinforcement fiber from the derived equations of Higdon in order to maintain the structural integrity of the reinforcement fiber as taught by Wright.

With respect to claim 5, as discussed in the rejection of claims 1 and 4, the leading edge of Wright's base ring has a radius of curvature greater than or equal to the critical bending radius of the reinforcement fiber. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the reinforcement fiber will maintain its structural integrity, and therefore, its proper functioning will be preserved.

Regarding claim 6, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the structure as applied above against claims 1 and 4 as well as the thought processes required for a standard engineering homework problem would satisfy the

Art Unit: 2882

the calculated critical bending radius, securing the reinforcement fiber around the base ring, and crimping the fiber in place with a crimp ring.

With respect to claim 7, Write does not specifically disclose determining the material properties and dimensions before performing the calculations. Based upon col.8, lines 3-7, Write does teach an experimental approach in order to determine the critical bending radius for a given reinforcement fiber. Also, as argued above against claims 2-3 in light of Higdon, the claimed calculation is well known and expected of sophomore engineering students.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to readily measure the diameter and run basic tensile tests in order to find a reasonable elastic modulus and tensile strength from one data plot. More realistically, one would find such data on the specification sheet that accompanies the fiber shipment or call the manufacturer to obtain the data.

Regarding claims 8-9, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the structure and method as applied above against claims 1-4 and 6-7 would satisfy the method as outlined, including:

- 1) selecting a base ring with a leading edge having a first radius of curvature (items 62 and 71 of Fig.3 of Wright, as well as col.8, lines 3-7).

- 2) determining the diameter, elastic modulus and tensile strength of a selected

Art Unit: 2882

3) determining the critical bending radius of the reinforcement fiber by multiplying the diameter of the fiber by the elastic modulus and dividing by two times the tensile strength (taught by Higdon and basic process required to solve related homework problem).

4) making sure the base ring satisfies the required critical bend radius requirement (taught by Wright, col.8, lines 3-7), and

5) securing and crimping the reinforcement fibers around the base ring with the crimp ring.

Art Unit: 2882


*Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Underwood (US 5,806,175), Nakajima (US 6,431,783) and Betzler (US 4,804,252) disclose various prior art crimping methods and related structure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (703) 305-0203. The examiner can normally be reached on 8am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

TRA   
February 13, 2003

